



Green Growth: a path for a more sustainable world – Literature Review

Fernando Júnior Resende Mascarenhas¹

Raquel Sampaio Jacob²

Abstract: Since Industrial Revolution the world has faced tremendous social, economic and environmental changes. The accelerated economic growth with no concerns has caused serious damages such as poverty, unemployment and environment destruction. Overcoming these challenges can be possible through green growth, which is an economic tool whose main objectives are to integrate technological, economic and social development with the most adequate use of natural resources. Strategies and policies are fundamental to make that greener growth occurs, and public and private sectors of the society must work together. Public policies, educational campaigns, investments in innovation and technology and the adoption of the most appropriate strategy for each country's development standard are crucial. Three countries with green growth programs are: Chile, Korea and Germany. Furthermore, Civil Engineers, which are qualified professionals, are required to lead necessary transformations. Hence, it is important to visualize green growth as a tangible and urgent need of the modern society.

Keywords: Green growth; Strategies; Development; Innovation; Civil Engineers.

¹ Pontifícia Universidade Católica de Minas Gerais, unidade Barreiro (PUC Minas Barreiro)

² Pontifícia Universidade Católica de Minas Gerais, unidade Barreiro (PUC Minas Barreiro)

1. Introduction

The Industrial Revolution raised the world to a new economic, social and consuming development standard. According to Clark Nardinelli (2008), an economist at the U.S. Food and Drug Administration, the Industrial Revolution “caused a sustained rise in real income per person in England and, as its effects spread, the rest of the Western world”. However, it has in many ways benefitted society through technological improvements and industrial growth. Allen (2006) points out that the Industrial Revolution was essentially a technological revolution, and his statement is supported by Joel Mokyr, cited by Evans and Rydén (2006), who argues that “the key to the Industrial Revolution was technology”.

Although it had its benefits, this economic model is currently saturated because it has caused unemployment, poverty and environmental degradation. Eric McLamb (2011), founder and CEO of “Ecology Communications Group Inc.” states that the Industrial Revolution’s consequences “on natural resources, public health, energy usage and sanitation” were tremendous.

Based on what has happened since the Industrial Revolution, the current world demands a more suitable and efficient model that addresses its requirements and limitations. According to Statistics Netherlands (2013), “the recent financial and economic crisis has led to the call for the transition towards a more resource efficient and less polluting economy that also may provide new economic opportunities”. The World Bank (2012), through the report “Inclusive Green Growth: The Pathway to Sustainable Development”, explains that “our current growth patterns are not just unsustainable; they are also deeply inefficient”; and it advocates for sustainable development.

New economic prospects can be found through green growth, which is an economic and infrastructural tool that can overcome these challenges. The Organization for Economic Co-Operation and Development (OECD, 2014) reports that green growth promotes an enhancement in infrastructure, reduces health problems correlated to “environmental degradation”, offers adequate technologies “that can reduce costs and increase productivity” (OECD, 2014). Thus, it “is necessary, efficient, and affordable” (The World Bank, 2012).

Hence, this paper presents a literature review about the green growth issue. It will discuss its precise definition and implications; its main strategies pointed out in three successful countries in assessing green growth; and the role that Civil Engineers play on it.

2. Overview

Mebratu (1998) claims that “during the past two centuries, and especially during the last five decades, the global economy has shown incredible growth, transforming the character of the planet and especially of human life”. Based on this, Zervas (2012) says that before establishing any definition of green growth it is important that we conduct an “examination of the historical evolution of the relationship among human beings and physical environment”.

In a brief explanation, according to Zervas (2012) there are three environmental periods. The “absolute (or almost) ignorance of environment” period is the one where mankind interacted with nature and caused serious damages without concerns about their effects on the environment (Zervas, 2012). In the “dilemma of environmental protection versus economic growth” period people began to realize that economic growth brings negative impacts with it, and they start to analyze the relationship between environment protection and economic growth (Zervas, 2012). Notwithstanding, this scenario was chosen as the most relevant for the society even the unfavorable aspects of economic growth (Zervas, 2012).

The third period is called “sustainable development”, in which governments understand the importance of encouraging an economic growth in a sustainable way, so in 1983, the meaning of sustainable development was agreed upon (Zervas, 2012). Since this period, many changes have been observed. Martinelli & Midtun (2012) point out that “over the last four or five years the world has seen a dramatic change in international climate negotiations”.

3. Green Growth

Colby (1991) said that in the 90`s, sustainability used to be seen as a “necessary constraint for ‘green’ growth”. Based on this statement, Zervas (2012) claims that it was the first time that the term ‘green growth’ was cited in a scientific article. Moreover, Zervas (2012) argues that Colby (1991) was referring to a study conducted by J. Pezzey in 1989, who did not mention the term in the studies conducted by him.

The expression ‘green growth’ that used to be “rarely heard before 2008” currently “occupies a prominent position in the policy discourse of international economic and development institutions” (Jacobs, 2012). Zervas (2012) and Lee *et al.* (2012) observe that the term ‘green growth’ emerged on the international stage when it was given a special attention in 2005 at the Fifth Ministerial Conference on Environment and Development in Asia and the Pacific funded by United Nations Economic and Social Council (UN ESCAP).

3.1 Definitions

According to the Organization for Economic Co-operation and Development (OECD, 2015) “green growth means fostering economic growth and development, while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies”.

Korea's Presidential Committee on Green Growth, which is cited in Lee *et al.* (2012), emphasizes that “green growth is designed to reduce greenhouse gases and environmental pollution. At the same time, it is designed to maintain environmental preservation and economic growth”. In addition to this, “green growth protects environment and makes new industries and jobs with clean energies such as solar, wind, tide/wave/ocean, hydro power and green technologies instead of fossil fuels like oil and coal. It becomes a new locomotive of national economic growth. The key to green growth pursues economic growth by minimizing the use of natural resources and environmental pollution so that it makes a virtuous cycle” (Lee *et al.*, 2012).

The World Bank (2012) states five important elements of green growth. First, “inclusive green growth is necessary, efficient, and affordable” (The World Bank, 2012). Second, “greening growth is constrained by social and political inertia and by a lack of financing instruments – not affordability, as is commonly believed” (The World Bank, 2012). Third, “greening growth should be carefully sequenced – not occur in one fell swoop – with priority going to what needs to be done in the next 5 to 10 years, both to avoid getting locked into unsustainable paths and to offer immediate, local benefits” (The World Bank, 2012).

The fourth decisive requirement for green growth is that “the search for solutions needs to shift from a search for more financial resources” (The World Bank, 2012). And, fifth, “there is no single green growth model” (The World Bank, 2012); in other words, Samans (2013) explains that “accepting a country's growth targets as a given” is more significant “than trying to adapt or subordinate them to a particular environmental agenda”.

Samans (2013) effectively summarizes that green growth “seeks to fuse sustainable development's economic and environmental pillars into a single intellectual and policy planning process, thereby recasting the very essence of the development model so that it is capable of producing strong and sustainable growth simultaneously”.

3.2 Green Growth and Sustainable Development

Lee *et al.* (2012) propose that “the concept of green growth starts with the introduction of sustainable development”, which was introduced in 1980 at the ‘International Union for

Conservation of Nature'. According to United Nations (UN) 1987 Brundtland Report, cited by Samans (2013), sustainable development is "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Moreover, the World Bank (2012) points out that sustainable development have three components: economic, social and environmental sustainability.

OECD (2015) claims that green growth is part of sustainable development, and it can be seen as a general idea that green growth is a tool or pillar that allows this concept to become tangible and achievable. Moreover, Jacobs (2012) holds the position that green growth is a "child of sustainable development" with a "more focused concept" on "climate change and economic growth".

4. Green Growth Strategies

According to 'Towards Green Growth' (2011), green growth propositions need to be established based on policies, legislations and parameters that will guide governments in their actions. Thus, developing and developed countries present differences in green growth policies. Developing countries have the opportunity to project and invest in more effective infrastructure and energy efficiency because their societies are still facing transformative processes. On the other hand, developed countries tend to invest their money in innovation (OECD, 2011; The World Bank, 2012).

The 'Towards Green Growth' report (2011) emphasizes that economic and practical instruments combined are crucial to the growth and the development in a harmonious way. This new economic model is focused on modernizing the local and worldwide economy raising sustainable policies and business based on the financial commitment of countries, application of legislation, and international cooperation such as the exchange of knowledge and information, which will produce more innovations and technologies (OECD, 2011). Hence, "high-level leadership is important to ensure that key political and societal leaders will openly support transformative change by building processes to ensure public acceptability, support from key stakeholders, and alignment to domestic priorities and budgets" (Green Growth Best Practice, 2014).

OECD (2011) argues that innovation plays an important role in the greening process. The current production and consuming model and technologies need to be addressed. An enhancement in productivity; emergence of new markets, improvement to infrastructure and search for new technologies are needed. "Innovation can help to decouple growth from natural capital depletion" (OECD, 2011).

Ferrer (2012) observes that there are four main areas in which the European Union (EU) budget can have a positive and robust impact “on Europe’s long-term growth and sustainability: Research and Development (R&D) and innovation, energy and transport, resource efficiency and strategic planning”. According to Ferrer, Behrens & Egenhofer, cited by Ferrer (2012), “the European Commission estimates that the investment needed to complete the priority European power and gas networks is in the range of €200 billion up to 2020, and for transport the Commission estimates that €500 billion will be needed for the trans-European networks, of which €250 billion is required to complete the missing links in the core network”. For instance, Tol (2012) says that “the green revolution is within the energy sector. As renewable energy expands, fossil energy contracts”.

In summary, “green growth strategies need to encourage greener behaviour by firms and consumers, facilitate smooth and just reallocation of jobs, capital and technology towards greener activities and provide adequate incentives and support to green innovation” (OECD, 2011).

4.1 Green Growth indicators

Green growth indicators are part of the ‘Green Growth Strategy Synthesis Report’, which was made at the OECD Ministerial Council Meeting, in 2009 (Lee *et al.*, 2012). To establish a greener growth, “appropriate information and reliable indicators that support policy development and analysis while tracking progress” are required (OECD, 2015).

The report made by ‘Green Growth Indicators’ (OECD, 2014) points out that “the indicators need to be embedded in a conceptual framework, selected according to well specified criteria, and based on internationally comparable data”. The OECD (2015) framework for measuring established the green growth indicators in four groups “in consideration of interaction between green growth components such as economy, environment and systems” (Lee *et al.*, 2012).

The first indicator is the environmental and resource productivity of the economy, which is used to “to capture the need for efficient use of natural capital and to capture aspects of production which are rarely quantified in economic models and accounting frameworks” (OECD, 2014). In other words, it measures how much an economic activity can consume and produce generating less deterioration to the environment and less use of natural resources. This indicator covers topics such as innovation; energy consumption and productivity; type of material used; quantity of carbon emissions; amount of water used; and the generation of waste (OECD, 2014). For example, Denmark is one the countries where the “wind industry was built on a history of excellence in mechanical engineering and light industry” because it was one of

the few countries to believe in the potential of this source of energy. Due to the elevated costs, everything was possible only due to governmental support and financing (Tol, 2012).

The second indicator defines the environmental and economic assets, which identifies activities that can degrade the environment now or in the future and the storage of certain natural resources (OECD, 2014). Certain resources such as aquatic, forest, mineral, water, land, soil, energy and biodiversity require more surveillance. Moreover, the availability, quantity, accessibility and diversity of renewable and non-renewable natural resources need to be analyzed and organized (OECD, 2014). Annual rainfall per capita is a relevant indicator because it helps to manage the water resources; thus “if the indicator shows an increasing pattern, it can be translated as a positive sign” of availability of water to the population (Lee *et al.*, 2012). Annual rainfall per capita is calculated by dividing the total annual-rainfall with the total population where the total annual rainfall was calculated by multiplying the total national territory and the annual rainfall average (Lee *et al.*, 2012). As an illustration, Korea’s annual rainfall per capita was 2,810 m³/capita in 2000, and moved up to 3,069 m³/capita in 2010 (Lee *et al.*, 2012).

The third indicator evaluates the environmental quality of life, which interprets what the influence of the environment on people’s lives (OECD, 2014). This indicator measures how the population’s exposure to air pollution, access to treated water sources and sewage treatment impact their health conditions (OECD, 2014). For example, Wales Cymru has investments in waste infrastructure of up to £750 million “to support local authorities delivering next generation treatment facilities” (Government of Wales Cyrus, 2014).

The fourth indicator monitors the policies and economic opportunities compounded by actions and policies that governments adopt in supporting of green growth (OECD, 2014). Those indicators focus on investments made by countries in technology and innovation in production, as well as whether a certain country is exchanging its information and collaborating with other countries. Moreover, they analyze if the knowledge (education) has been spread appropriately (OECD, 2014). For instance, Mexico has invested in comparative studies to understand “the differences between Mexico’s own baseline, and that generated by using a different model” (Green Growth Best Practice, 2014).

According to Hoffmann (2015), governments “need to realize that the required transformation goes far beyond innovation and structural changes to include better distribution of income and wealth, limitation of market power of economic agents that promote biased approaches to greenhouse gases (GHG) reduction, and a culture of sufficiency”.

Based on this, OECD (2014) points out that there are indicators that associate all indicators that were mentioned before within a social context. Indicators of socio-economic context are fundamental for the development and implementation of strategies. These indicators

incorporate economy, trade and regulation; income distribution; labour market; education rates; health and sanitation; and infrastructure (OECD, 2014).

The evolution from traditional growth, which is based on exploring the Earth's natural sources, such as fossil fuel and forests, to a more adequate green economy can be reached through strong and organized action between all sectors of the society. In addition to this, knowledge and the development of appropriate skills are important to adequately establish the new products, processes and services (OECD, 2011).

As consequence of the development of appropriate skills, new job opportunities are going to be created. Bahrens and Colijn (2012) state that “as with other general purpose technologies, like the invention of the steam engine or the increasing application of information and communication technologies (ICT), the labour market landscape can be influenced quite substantially. Depending on where in the process of adopting the general purpose technology an economy is, it will have a small to very large impact on job creation, skill development, labour market regulation and participation and education” (Bahrens & Colijn, 2012).

The Green Economy Accord established by South Africa intends to create around 300,000 green jobs by 2020, and 80 percent of those new jobs are directed at young workers. This aim will be possible due to a partnership between all sectors of the economy, labor unions and government (Green Growth Best Practice, 2014).

5. Countries that adopt Green Growth policies

As environmental protection, economic growth, poverty decrease and resource efficiency are aims that can be achieved through green growth; it has become more and more interesting and inviting for countries (Green Growth Best Practice, 2014). According to OECD (2015) and Green Growth Best Practice (2014) there are countries in Latin America, North America, Asia, Europe, Africa and Caribbean area that are adopting green growth strategies. The next section will discuss three countries with successful green growth strategies, and others that have adopted those strategies recently and still need more improvement in the indicators discussed previously.

5.1 Chile

In December 2013, Chile presented the National Green Growth Strategy which proposed actions over the short, medium and long term, from 2014 until 2022 (Green Growth Best Practice, 2014). Chile's Green Growth Strategies focus on sustainable mining, tourism, construction, agriculture (wine production), “extended producer responsibility, tradable

emissions permit, voluntary agreements, fuel taxation, green public procurement, eco-labeling, tradable fishing quotas, tradable water rights, cross-sector environmental technology, energy efficiency and renewable energies” (Martinez-Fernandez *et al.*, 2014).

The renewable energy sector in Chile (the majority of which hydropower nowadays) is the one that concentrates the most powerful of Chile’s green growth policies. The government’s plans are to replace hydropower with wind, photo voltaic and geothermal sources of energy that are more sustainable and contribute to create more competitive industries in the country (Grunewald, 2015).

This scenario will be achieved mainly through the electrification of rural areas. Choosing the rural areas is done for two main reasons. First, implementing a new source of energy that contribute to a “potential to reduce CO₂ emissions”. Second, rural areas are largely occupied by indigenous people, so this project will increase those population’s quality of life (Grunewald, 2015).

Martinez-Fernandez *et al.* (2014) explain that civil construction field has a huge impact on energy consumption in Chile. Moreover, they [16] advocate that the strongest potential for “action is in existing houses” because less than 2% of built houses in Chile are in accordance with minimal of thermal requirements.

5.2 Korea

Korea’s green growth policies became extensive in 2009 (Lee *et al.*, 2012), and the country developed the National Strategy with actions over the short, medium and long term, from 2009 until 2050, (Choi, 2014) adopting “a green growth strategy to drive economic competitiveness through development and use of advanced technologies” (Green Growth Best Practice, 2014).

The country’s strategies and policies are built on the collaborative work of different parts of society. These policies’ main objectives aim to safeguard the economic development and address the principal environmental problems (“air, water and noise pollution, and soil contamination”) integrated by social improvement (Green Growth Best Practice, 2014).

One main concern of the South Korean Government is the country’s energy dependency. According to Green Growth Best Practice (2014), “its major productive industries, such as steel and chemicals are 97% dependent on energy imports”. Overcoming this problem in search of green growth, the government wants to ensure its low-carbon emissions, energy security, technology innovation and social benefits (Green Growth Best Practice, 2014).

The Korean government truly believes that creating a strong and solid base is important, and it is based on education. The Korea Presidential Committee on Green Growth, cited by

Green Growth Best Practice (2014) started with a 5-year plan, from 2009 until 2013, that delivered messages to the population through “presidential speeches, celebrity endorsements, and educational campaigns”.

As mentioned before, the Korean government believes that education plays an imperative role in the entire process. Based on this, the government “has invested in greening education policies for university students as they have been identified as a primary target group for skill development and education policy in the green economy transition (Green Growth Best Practice, 2014). In addition to this, investing in education contributes to enhance the labor market and opportunities.

Korea accomplished a great task from 2000 to 2010 on the indicator of environmental quality of life in three segments according to Lee *et al.* (2012) report. First, the population exposed to air pollution decreased by 4.6% from 2000 to 2010. Second, the urban green area per capita increased by 19.5% from 2005 to 2010 because the projects creating more urban forest. Third, the amount of the population that has sewage treatment increased from 70.5% to 89.4% from 2000 to 2009 (Lee *et al.*, 2012).

Choi (2014) claims that financed support and planning by the government played an important role in Korean green growth policies. As an illustration, the government created the “2 percent budget rule”, in which at least 2% of Gross Domestic Product (GDP) would be used for implementing green growth strategies (Choi, 2014).

5.3 Germany

Germany (together with Denmark and Sweden) was one of the first countries in Europe to adopt green growth policies (The World Bank, 2011). The Green Growth Best Practice (2014) report states that “Germany’s green growth policies have been an important engine for environmental innovation, enabling the development of an internationally competitive environmental goods and services sector particularly focused on renewable energy”.

Since 1990, the Government of the Federal Republic of Germany has created strategies focused on developing and maintaining renewable energy sources. In 2000, Germany launched an “ambitious plan” whose major objectives were to reduce the dependence of fossil fuels and increase the use of renewables (Green Growth Best Practice, 2014).

In 2012 the country adopted the National Sustainable Development Strategy with initiatives and policies in innovation, energy resources, climate changes and biodiversity (Green Growth Best Practice, 2014). Moreover, “rigorous implementation of environmental policies has helped curb the carbon, energy and resource intensities of Germany’s economy, improve natural

asset management and enhance the environmental quality of life of the population” (OECD, 2012).

The World Bank (2011) points out several reasons by which Germany has become the exponent and the head of green growth in Europe. First, since 1969 the country has “implemented environmental legislation” (The World Bank, 2011). During the unification of East and West Germany, a huge number of polluting firms in the east were closed. Furthermore, the “ecological tax reform” launched in 1999 and improved in 2003 “increased the taxes in energy consumption” (The World Bank, 2011). For instance, when the Kyoto Protocol was signed, the European Union (EU) committed to reduce their emissions of greenhouse gases by 8 percent by 2008-12 (compared to 1990 levels). In turn, Germany committed to reduce them by 21 percent (The World Bank, 2011).

The second reason is related to governmental investments in renewable energy sources. “In 2010, Germany was the world’s largest investor in new capacity in PV solar and biodiesel production, the second biggest in solar hot water/heat (after China), and fifth biggest for wind power (after China, India, Spain, and the U.S.)” (The World Bank, 2011). From 1990 to 2013, the consumption of renewable energies jumped from 4 percent to 25 percent (Green Growth Best Practice, 2014).

The third reason is that due to the spread of knowledge and information. The population became more “aware of environmental issues” (The World Bank, 2011). This change has implication in political, social and technological spheres. Once the consumers are more conscious about this theme, they show more interest in “environmentally friendly products”, which makes companies invest in environmental production technologies (The World Bank, 2011).

Germany plays an import role worldwide because it has contributed to spreading and enhancing green growth ideas. “Its leadership role has extended to the broader international community, as well as to supporting environmental progress in developing countries” (OECD, 2014).

Job creation is one major benefit of its green policies. “Improving its environmental performance and quality of life, strong environmental policies have helped stimulate environmental innovation and an internationally competitive environmental goods and services (EGS) sector” (OECD, 2012). According to German Ministry for the Environment, cited by Behrens & Colijin (2012), in its clean energy industry, 381,600 people were employed in 2011.

In addition to this, “some estimates suggest that the environmental goods and services (EGS) sector (broadly defined) could grow by about 7.7% annually to reach EUR 300 billion by 2020, and serve as an important source of economic growth and jobs”. (OECD: Germany, 2012)

6. The role of Civil Engineers in Green Growth

A mutual engagement of governments, society, private sectors and specialized professionals is required to promote these transformative processes from conventional growth to green growth. Some of the most important thinkers and runners of this economic and environmental change are engineers. Many “professions require an engineering science education or education in natural sciences” (Martinez-Fernandez *et al.*, 2014).

Bilec *et al.* (2007) states that civil engineers have played an important role in social development “from the Roman viaducts, to the tallest buildings, to the Hoover Dam; civil engineers have undeniably made an impact on society and the Earth”, and they “can contribute solutions to sustainable development and green design issues”.

The American Society of Civil Engineers (ASCE), the Canadian Society for Civil Engineering (CSCE) and the Institution of Civil Engineers (ICE) (2012) remark that “civil engineers of the 21st century are called on to play a critical role” identifying problems and proposing the most appropriate solutions for them.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) (2010) emphasizes that “issues of energy, transportation, climate change, environmental protection and natural resource management, among numerous others” must be conducted among engineering concerns. ASCE, CSCE and ICE (2012) hold the same position emphasizing that Civil Engineers are crucial in “areas as water supply and sanitation, food production and processing, housing and construction, energy, transportation and communication, income generation, and employment creation”.

Behrens & Colijn (2012) comment that “in order to advance” in green technology and promote the necessary changes, “highly skilled experts who work in the sustainability field” are required, and one of these specialists is the engineer. They play an important role making green growth occur in two different ways. First, engineers are required to design and build green systems and materials. Second, engineers are extremely important to guide these transformations acting as critical thinkers of costs and benefits of projects.

Thompson & Joseph (2011) explain that there are six priority areas that contribute to green growth: “sustainable transportation; energy efficiency of buildings; renewable electricity and conservation; wastewater treatment and water conservation; efficient urban land use and solid waste management”. Civil Engineers are the protagonists who will work in those areas and make green growth changes possible.

Based on what Thompson and Joseph (2011) propose, Civil Engineers are necessary to develop more efficient and less polluting construction materials, which are required to build more adequate and cleaner transport infrastructure. Likewise, they are fundamental in creating more efficient water and wastewater treatment plants.

Bilec *et al.* (2007) additionally explain the importance of Civil Engineers as leaders. The authors argue that “educated civil engineers can inform developers, the public, and policymakers of the benefits and trade-offs associated with sustainable design”. Regardless, “an educated public and policymakers, our current and future clients, will then have the knowledge to support and promote our proposed sustainable and green designs” (Bilec *et al.*, 2007).

Engineers must develop a multidisciplinary ability to lead, analyse and provide the most appropriate, sustainable and innovative alternatives to address the challenges related to economic, constructive and environmental issues. For instance, in road or hydroelectric, engineers have to understand their responsibilities in explaining to the population involved with this project the possible consequences in their lives, analyse the costs, and the possible implications generated by that civil work to the environment and alternatives to avoid or mitigate them.

7. Conclusion

The Industrial Revolution raised the world to a new economic and consuming development model. Although it has created beneficial consequences to the society, this economic standard is currently saturated because it has caused unemployment, poverty and environmental degradation. The current world demands a more suitable and efficient model that addresses its requirements and limitations.

A new economic prospect can be found on green growth, which is an economic and infrastructural tool that can overcome these challenges. Green growth is essentially an economic and practical instrument that combines growth and development in a harmonic form in which there is production enhancement, infrastructure improvement and aware of natural resources exploitation without economic troubles and minimum environmental impacts.

Countries that do not have green growth policies or that have implemented in misguided way must take countries that successfully adopted green growth strategies such as Chile, Korea and Germany, so that, they should create their own strategies based on their social, political, economic and environmental standards.

In addition to this, engineers are fundamental in leading these transformations. They are the professionals who will design and build more economic and environmental efficient buildings

and cities paying special attention in areas such as transportation, energy resources and water and wastewater treatment plants.

Thus, green growth is necessary to modernize the local and worldwide economy raising sustainable policies and business based on the financial commitment of public and private sectors on the creation and application of legislations. Moreover, the international cooperation such as the exchange of knowledge and information will produce more innovations and technologies.

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